ground water conditions but can be transformed into dichloroethylene, vinyl chloride (a human carcinogen), and other chlorinated compounds. H can also be mineralized to inorganic products under anaerobic conditions. Such knowledge is essential in attempts to estimate the environmental significance, determine the original source of the contamination, and formulate cleanup strategies. For materials that sorb to soils, the mass of contaminant contained in aquifer water may be small in comparison with that sorbed to soil. Removal of the sorbed contaminant as well as that dissolved in the water must be undertaken in order to restore the quality of aquifei water. The best removal and ground water treatment procedures are also related to the properties of the contaminants.

Population Patterns

The impacts of projected population increases or decreases and industrial and land use changes are an important element in the management of water quality. There is a potential for dynamic change, e.g., snowbelt-sunbelt shift in population and industrial relocation and growth of high-tech industries versus heavy manufacturing.

Planners use this information as they look at the carrying capacity of the aquifers and the availability of proper waste disposal for both municipal and industrial waste. Certain types of uses can be matched to existing water quality (if there are no legal restraints), thereby reducing treatment costs. For example, irrigated farmlands can be expected to have contributed a variety of organic knd/or inorganic chemicals to the vadose zone or to the water table. If this land is converted to urban use, treatment of the ground water for human consumption can be expected.

With population increases, the demand on an aquifer can result in the aforementioned changes in water quality from pumping alone. (See previous section on "Water Extraction and Use Patterns.") Large new home developments using septic systems can cause considerable water contamination problems. An influx of newly developed industries can be responsible for contamination of ground water through inadvertent spills and leaking petroleum and chemical storage tanks. On the other hand, where there is a decrease in population growth or shift in industrial location, some previous contamination problems may be reduced.

Data Processing and Analysis

Data Collection and Processing

Because of the diffuse nature of ground water sources and of the location of potential polluting activities, it is important to have a data base that